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10/511,968	08/26/2005	Jan Vermehren	514413-3951	8472

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EXAMINER	
BALASUBRAMANIAN, VENKATARAMAN	
ART UNIT	PAPER NUMBER
1624	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/511,968	VERMEHREN ET AL.	
	Examiner	Art Unit	
	/Venkataraman Balasubramanian/	1624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 18-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 18-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/26/2010, 04/15/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicants' response, which included cancellation of claims 9-17, addition of new claim 20 and amendment to claim 1, filed on 04/15/2010, is made of record. Claims 1-8 and 18-20 are now pending. In view of applicants' amendment, all 103 rejections and double patenting rejections made in the previous office action have been obviated. However, the following 112 first paragraph reject patenting in the previous office action is maintained. In addition a new ground of rejection is applied to currently pending claims 1-8 and 18-20.

Information Disclosure Statement

References cited in the Information Disclosure Statements, filed on 01/26/2010 & 04/15/2010, are made of record.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8 and 18-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for making isocyanate of formula V does not reasonably provide enablement for making the solvate of the isocyanate of formula V. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

In evaluating the enablement question, several factors are to be considered. Note In re Wands, 8 USPQ2d 1400 and Ex parte Forman, 230 USPQ 546. The factors include: 1) The nature of the invention, 2) the state of the prior art, 3) the predictability or lack thereof in the art, 4) the amount of direction or guidance present, 5) the presence or absence of working examples, 6) the breadth of the claims, and 7) the quantity of experimentation needed.

1. The nature of the invention and the state of the prior art:

The invention is drawn to compound of formula (V), or solvate thereof. Specification is not adequately enabled as to how to make solvate of compounds of formula (V) Specification has no example of solvate of the instant compounds. Specification recites solvate thereof but there is no enabling of such compounds.

The compound of formula V embrace benzene sulfonylisocyanate compounds substituted with variable group X", and solvate thereof. Specification has no teaching of any solvate or hydrate or polymorph of this large genus.

Search in the pertinent art, including water as solvent resulted in a pertinent reference, which is indicative of unpredictability of hydrate formation in general. The state of the art is that is not predictable whether solvates or hydrates will form or what their composition will be. In the language of the physical chemist, a hydrate of organic molecule is an interstitial solid solution. This phrase is defined in the second paragraph on page 358 of West (Solid State Chemistry). The solvent molecule is a species introduced into the crystal and no part of the organic host molecule is left out or replaced. In the first paragraph on page 365, West (Solid State Chemistry) says, "it is

not usually possible to predict whether solid solutions will form, or if they do form what is the compositional extent". Thus, in the absence of experimentation one cannot predict if a particular solvent will solvate any particular crystal. One cannot predict the stoichiometery of the formed solvate, i.e. if one, two, or a half a molecule of solvent added per molecule of host. Compared with polymorphs, there is an additional degree of freedom to hydrates, which means a different solvent or even the moisture of the air that might change the stabile region of the hydrate. In the instant case of hydrate a similar reasoning therefore applies. Water is a solvent and hence it is held that a pertinent detail of West, which relates to solvates, is also applicable to hydrate. Specification has no working example of solvate or polymorph of compound of formula (I); In view of the lack of direction provided in the specification regarding the starting materials, the lack of working examples and the general unpredictability of chemical reactions, it would take an undue amount of experimentation for one skilled in the art to make the claimed compounds and therefore practice the invention. The starting material sources necessary to obtain the instant compounds must have been available as of the filing date in order to provide an enabling disclosure. See In re Howarth, 654 F.2d 103,210 USPQ 689 (CCPA 1981); Exparte Moersch, 104 USPQ 122 (POBA 1954). Specification is not adequately enabled as to how to make solvate of compounds of formula (I). Specification neither discloses what types of solvates are intended nor has any examples of solvates of the instant compounds. Specification recites solvates but there is no enabling disclosure of such solvates or hydrates. Search in the pertinent art,

including water as solvent resulted in a pertinent reference, which is indicative of unpredictability of solvate formation in general.

In addition, an additional search resulted in Vippagunta et al., Advanced Drug Delivery Reviews 48: 3-26, 2001, which clearly states that formation of hydrates in unpredictable. See entire document especially page 18, right column section 3.4. Note Vippagunta et al., states “Each solid compound responds uniquely to the possible formation of solvates or hydrates and hence generalizations cannot be made for series of related compounds”.

Also, note MPEP 2164.08(b) which states that claims that read on "... significant numbers of inoperative embodiments would render claims nonenabled when the specification does not clearly identify the operative embodiments and undue experimentation is involved in determining those that are operative.". Clearly that is the case here.

2. The predictability or lack thereof in the art:

Hence, the solvate as applied to the above-mentioned compounds claimed by the applicant are not art-recognized compounds and hence there should be adequate enabling disclosure in the specification with working example(s).

3. The amount of direction or guidance present:

Examples illustrated in the experimental section are limited to making the compounds not related to solvates. There is no example of a solvate of instant compound (V) or the isocyanate compound V itself. Hence it is clear that merely bring the compound with solvent or water does not result in solvate or hydrate and additional

direction or guidance is needed to make them Specication has no such direction or guidance.

4. The presence or absence of working examples:

There is no working example of any solvate or hydrate or polymorph formed. The claims are drawn to hydrate, yet the numerous examples presented all failed to produce a solvate or hydrate or polymorph. These cannot be simply willed into existence. As was stated in Morton International Inc. v. Cardinal Chemical Co., 28 USPQ2d 1190 "The specification purports to teach, with over fifty examples, the preparation of the claimed compounds with the required connectivity. However ... there, is no evidence that such compounds exist... the examples of the '881 patent do not produce the postulated compounds... there is ...' no evidence that such compounds even exist." The same circumstance appears to be true here. There is no evidence that hydrates of these compounds actually exists; if they did, they would have formed. Hence, there should be showing supporting that solvates of these compounds exist and therefore can be made.

5. The breadth of the claims & the quantity of experimentation needed:

Specication has no support, as noted above, for compounds generically embraced in the claims 1-8 and 18-20 would lead to desired solvate , hydrate or polymorph of the compound of formula I. The quantity of experimentation needed would be an undue burden on skilled art in the chemical art since there is inadequate guidance given to the skilled artisan for the many reasons stated above. Even with the undue burden of experimentation, there is no guarantee that one would get the product of

desired solvate of compound of formula (V) embraced in the instant claims in view of the pertinent reference teachings.

MPEP 2164.01(a) states, "A conclusion of lack of enablement means that, based on the evidence regarding each of the above factors, the specification, at the time the application was filed, would not have taught one skilled in the art how to make and/or use the full scope of the claimed invention without undue experimentation. In re Wright, 999 F.2d 1557,1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)." That conclusion is clearly justified here. Thus, undue experimentation will be required to make Applicants' invention.

This rejection is same as made in the previous office action now includes newly added claim 20. Applicants' traversal is not persuasive.

The amendment to claim 1 to incorporate aprotic solvent and thereby claiming the solvate of the aprotic solvent thereof did not obviate this rejection Applicants' traversal lacks factual support. As discussed above, applicants' specification has no showing of solvate of isocyanates whether the solvent is aprotic or not. Applicants have not provided any direct evidence showing solvate of the isocyanate claimed. The evidence provided by the applicants does not show solvate of the isocyanates claimed. Applicants have not shown that isocyanate of formula claimed form solvate. Based references cited above, there is no reason to accept that given a compound, it will form solvate.

Applicants have argued that it is well known in the art that such isocyanate for solvate with aprotic solvent but have not provided any supporting evidence.

Furthermore, several prior art references including those cited in the IDS and even those with common inventor have used isocyanate as intermediate but have not shown the formation of solvate. Hence, prior art seems not to recognize the formation of solvate of isocyanate and since applicants are claiming such solvate, it is their burden to show such solvate exists and are formed with the claimed isocyanate.

Hence, this rejection is proper and is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vermehren et al., DE 199 463 41 (equivalent US 7,026,477) in view Stubbs, American Chemical Journal, 50, 193-204, 1913 and Chiang et al. EP 0759 431.

Vermehren et al. teaches several sulfonylurea compounds and the process of making which includes instant compounds and related process. See entire document. Especially, see page 4 for various steps in the process of making. Note these steps are also included in the instant claims and the genus of compounds overlap.

Vermehren et al., differs in not teaching the step a of instant process which require reaction of acid halide with RQH to form an ester and currently amended step b which requires direct reaction of metal cyanate with sulfonyl halide to make isocyanate. Instead, Vermehren teaches step c, the conversion of isocyanate derived from the said ester to urea.

Stubbs et al., teaches the first step of making the sulfonyl halide ester, namely step a of the claimed invention. See entire document. Especially see page 203.

Chiang teaches a process for making sufonylureas of formula I, which include the process step b and step c of the claimed invention. More specifically, Chiang teaches the process of preparing a stabilized isocyanate of formula V by direct reaction of compound of formula II with isocyanate III and subsequent reaction of V with VI to get the sulfonyl urea of formula I. See page 2, Equation 1 and Equation 2 which teaches the

process step b and process step c of the claimed invention. See pages 2-7 for details of the invention, preferred embodiments and process conditions. See Example I and claims 1-10.

Thus, one having ordinary skill in the art at the time of the invention was made would have been motivated to combine both the primary and secondary references and employ the process taught by these prior art to the starting materials and reactants of the instant invention and expect to obtain the desired product because he would have expected the analogous starting materials and reactants react similarly in view of the combine teaching of the prior art. It has been held that application of an old process to an analogous material to obtain a result consistent with the teachings of the art would have been obvious to one having ordinary skill. Note In re Kerkhoven 205 USPQ 1069.

See KSR International Co. v. Teleflex Inc., 127 S.Ct. 1727 (2007), wherein the court stated that

[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.

Such is the case with instant claims. Vermehren et al. teaches all the essential steps of the over all process and conversion of acid halide to an ester is taught by Koike and direct step to make isocyanate from the said ester and the subsequent conversion to urea is taught by Chiang. Hence, it would be obvious to one trained in the art to find

suitable process for making staring ester compounds and in light of such a positive teaching of Koike and Chiang one trained in the art would be motivated to combine these references to arrive at the instant process.

Claims 1-8 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vermehren et al., DE 199 463 41 (equivalent US 7,026,477) in view Koike et al., US 4,211,723 (equivalent DE 26 16 612 cited in the IDS) and Chiang et al. EP 0759 431.

Vermehren et al. teaches several sulfonylurea compounds and the process of making which includes instant compounds and related process. See entire document. Especially, see page 4 for various steps in the process of making. Note these steps are also included in the instant claims and the genus of compounds overlap.

Vermehren et al., differs in not teaching the step (a) of instant process which require reaction of acid halide with RQH to form an ester. And the currently amended step b of direct formation of isocyanate from the said ester.

Koike teaches the process of making several chlorosulfonylbenzoylchloride, chlorosulfonylbenzoate ester and its conversion to sufamidobenzoate. See entire document. Especially see column 1-6 for the process of making these compounds. Especially note in column, Koike teaches the process of making 0-chlorosulfonylbenzoate ester from the corresponding O-chlorosulfonylbenzoyl chloride as required by the claimed process. See first part of example 1.

Chiang teaches a process for making sufonylureas of formula I, which include the process step b and step c of the claimed invention. More specifically, Chiang teaches

the process of preparing a stabilized isocyanate of formula V by direct reaction of compound of formula II with isocyanate III and subsequent reaction of V with VI to get the sulfonyl urea of formula I. See page 2, Equation 1 and Equation 2 which teaches the process step b and process step c of the claimed invention. See pages 2-7 for details of the invention, preferred embodiments and process conditions. See Example I and claims 1-10.

Thus, one having ordinary skill in the art at the time of the invention was made would have been motivated to combine both the primary and secondary references and employ the process taught by these prior art to the starting materials and reactants of the instant invention and expect to obtain the desired product because he would have expected the analogous starting materials and reactants react similarly in view of the combine teaching of the prior art. It has been held that application of an old process to an analogous material to obtain a result consistent with the teachings of the art would have been obvious to one having ordinary skill. Note In re Kerkhoven 205 USPQ 1069.

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[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.

Such is the case with instant claims. Vermehren et al. teaches all the essential steps of the over all process and conversion of acid halide to an ester is taught by Koike and direct step to make isocyanate from the said ester and the subsequent conversion to urea is taught by Chiang. Hence, it would be obvious to one trained in the art to find suitable process for making staring ester compounds and in light of such a positive teaching of Koike and Chiang one trained in the art would be motivated to combine these references to arrive at the instant process.

Applicants have provided an affidavit of Dr. Ford to overcome the teaching of Chiang. Applicants' traversal based on the affidavit is not persuasive.

First of all, contrary to applicants' urging, claim 1 has no such limitations recited in the affidavit and the process taught by Chiang includes all the limitation of currently presented claim 1.

Secondly, the example 7 of claimed invention does not recite the process limitations of the affidavit and the process limitations recited in example 7 is same as the process of Chiang.

Thirdly, there is the process limitation "(B) When however the sulfonyl chloride and sodium cyanate are first reacted at 20°C with the pyridine and then the acetonitrile removed by distillation and replaced with xylene and the triazine added in ethyl acetate, then reaction at 55- 60°C affords 78% yield of the desired sulfonyl urea" as recited in the affidavit is new matter. If this limitation is not in the specification as originally presented and hence it would be deemed as new matter and rejected accordingly.

Hence, the above 103 rejections are proper.

Conclusion

Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 04/15/2010 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication from the examiner should be addressed to Venkataraman Balasubramanian (Bala) whose telephone number is (571) 272-0662. The examiner can normally be reached on Monday through Thursday from 8.00 AM to 6.00 PM. The Supervisory Patent Examiner (SPE) of the art unit 1624 is James O. Wilson, whose telephone number is 571-272-0661. The fax phone number for the organization where this application or proceeding is assigned (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAG. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-2 17-9197 (toll-free).

/Venkataraman Balasubramanian/

Primary Examiner, Art Unit 1624